



## AMS-02 Weekly Activity Report, August 5, 2005

### Upcoming Events:

- Uninterruptible Power Supply (UPS) Critical Design Review (CDR) – August 9, 2005 – Taiwan
- USS-02 Extruded Beams Delivery – Week of September 5, 2005
- AMS-02 Technical Electronics Meeting (TEM) @ CSIST – September 26-30, 2005 – Taiwan
- STA Vacuum Case Delivery (on dock at STADCO) – September 29, 2005 (subject to weld inspection and review)
- AMS-02 General Technical Interchange Meeting (TIM) @ CERN – October 24-28, 2005 – Geneva
- AMS-02 Phase II Safety Review – Date TBD (Schedule under review) – JSC

### Upcoming Tests:

- Interface Plate Static Test – Date TBD – Location TBD
- Lower Joint Static Test – Date TBD – Location TBD
- STA Sine Sweep Test – January 2006 – INFN, Terni, Italy
- STA Acoustic Test – April 2006 – ESTEC, Noordwijk, Netherlands
- Full Assembly Modal & Static Tests – May 2006 – IABG, Munich, Germany

### General

- AMS personnel met with Bill Earnest, ESCG Safety and Mission Assurance (S&MA), and Steve McDole, ESCG Quality/Product Assurance, to review the status of Quality Assurance (QA) efforts in Building 10. QA personnel will be receiving training and begin using the Vantage system in the near future; to ensure validity of manufacturing schedules. Additional personnel are being trained to operate the Configuration Measurement Machines (CMMs) in Building 10. Also, a test case of AMS Unique Support Structure (USS) hardware is being collected to test out the process and turnaround for outsourcing CMM work to SpaceHab. Each of these actions is being implemented to resolve the backlog of QA work that now exists. Another tag-up is scheduled in two weeks to assure progress and monitor performance.

### USS-02 and GSE:

- Alcoa reported that the first extruded beams they produced failed QA inspection in their facility. The extruded cross section of the -001 configuration beam failed ultrasonic inspection (USI) and the internal square is out of tolerance. The part failed USI due to flaws in material that were traced back to a bad ingot casting. Alcoa is currently investigating the cause for the out-of-tolerance condition. A new ingot to produce a replacement beam is on order. Alcoa has verified that the ingots procured to produce the other two extrusions (-003 & -005) are acceptable. Alcoa has also notified AMS project engineers that the schedule for production of the extrusions for the -003 & -005



configurations has slipped due to a delay in their receiving of the die “tip” used to make the hollow section of the beams. Alcoa has revised their delivery date to the first week in September.

- The assembly of the test article for the Rivet Test was initiated, but work had to be immediately suspended when it was observed that the rivet guns were not properly installing the rivets to be tested. It was determined that the tools did not have an adequate stroke for the length of rivet specified and would not break-off (pop) the rivet to complete the installation. AMS project engineers provided the supplier of the rivet gun (Wesco) with the exact specification and part number of rivet to be installed and the supplier recommended a rivet gun part number for the application. However, the recommended gun proved to be incorrect. Advel-Textron Cherry, makers of the rivet and the rivet guns was consulted about a replacement. Two of the guns that they recommend were already on-hand in the shop. A quick pull test was performed and it was verified that these guns do have the correct stroke. However, both guns require refurbishment due to leaky seals. The original supplier is refunding the cost of the incorrect rivet guns and the rivet guns to be refurbished are being expedited to Wesco for performance of the work. The guns are scheduled to be returned the week of August 8, and assembly of the test article will resume. When complete, the test article will be turned over to the Materials and Processes Branch (ES4) for the performance of an engineering evaluation to determine if the rivets are acceptable for use on the flight hardware.
- Work is continuing on updates to the USS-02 Build-up Procedure. The document is now approximately 95 percent complete. When complete, the procedure will be released as a “Book Form” drawing in EDCC.
- The USS-02 Build-up Assembly and Fixturing drawing was received from checking, the redlines incorporated, and the drawing returned to checking for final review.
- Final dispositions were prepared for seven Discrepancy Reports (DRs) written against the USS-02, Assembly Fixture and Primary Support Stand (PSS). Interim dispositions were prepared for two DRs written against the USS-02 hardware. The interim dispositions are for the affected parts to be fit checked at the assembly level.
- The USS-02 Alignment Template is being machined. The PSS Sliding Frames are in final machining.

#### Vacuum Case:

- The closeout weld on the Structural Test Article (STA) Vacuum Case (VC) will be performed at STADCO the week of August 8. Two ESCG engineers are at STADCO to oversee the cleaning, assembly, and weld operations.



- A new design engineer started on the AMS Project the week of August 1. After an indoctrination period on the Vacuum Case he will help with modeling and engineering drawings.

#### Avionics:

- The Critical Design Review (CDR) versions of the Design Document and Interface Control Documents for the Power Distribution System (PDS) were reviewed. Eight Open Paperwork Management Tool (OPMT) action items remain open from the PDS CDR. Efforts to close the actions are in work.

#### Structural Analysis:

- Structural analysis priorities have been shifted to complete the analysis and release the reports of the Vacuum Case Test Fixture (VCTF) and the Primary Support Stand (PSS). Completion of both the analysis and documentation for the VCTF and PSS is due to be completed by the end of September. Analysis reports of the Lower USS-02 Shipping fixture and the lifting fixtures are being reviewed for final release at the end of the current month.
- Analysis for the USS-02 Assembly continues. Updates to MathCAD templates for rivet analysis have been completed and implemented. This template provides a standardized approach to rivet analysis for all riveted joints of AMS-02.
- Post processing of the stresses for the Upper and Lower Support ring is on going. The support rings have a positive margin of safety. Post processing continues to eliminate the false stresses associated with rigid element connections in the models.
- Analysis for the PAS Aft and Vertex Brackets is on going. The current design of these brackets will have to be altered to increase the stiffness at PAS to station interface.
- Ground transportation analysis has begun for the flight hardware of AMS-02. The stresses resulting from this assessment will be used to determine the fracture and fatigue life of all of the AMS-02 flight hardware.